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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/840,126	05/05/2004	Robert Olsen	CISC/P856	7255
26541	7590	04/01/2008	EXAMINER	
Cindy S. Kaplan P.O. BOX 2448 SARATOGA, CA 95070			CHU, WUTCHUNG	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/840,126

**Applicant(s)**

OLSEN ET AL.

**Examiner**

WUTCHUNG CHU

**Art Unit**

2619

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SE/US)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Amendment*

1. This communication is in response to application's amendment filed on 12/27/2007. Claims 1-30 are pending.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-13, 15-19, 21-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Zdan (US7020143).

**Regarding claim 1**, Zdan disclose system for and method of differentiated queuing in a routing system comprising:

- a classifier operable to identify and classify incoming traffic streams (**see figure 2 box 220 and column 6 line 36 and 45-50**); and
- a queuing system comprising a plurality of queues and operable to apply scheduling policies to the traffic streams, the plurality of queues of the queuing system (**see figure 2 box 240 and column 6 line 56-60**) each comprising:
  - enqueue attributes configured to control a depth of the queue (**see column 6 line 57-61**); and

- dequeue attributes configured to control scheduling of the queue, said dequeue attributes comprising minimum bandwidth (see column 6 line 5), maximum bandwidth (see column 6 line 6), excess bandwidth (see column 6 line 6), and priority (see column 5 line 46-49), wherein each of the plurality of queues has one or more of said dequeue attributes defined (see column 8 line 41-67);
- wherein the pluralities of queues define a queue hierarchy (see figure 5 box 520 EF queue, box 530 AF1 queue), each layer of the queue hierarchy configured to support one or more priority queues and associated with a class (see figure 5 where middle column box 520 EF queue, box 530 AF1 queue, box AFN queue, and box 550 BE queue, and the right column box 570 high priority egress queue, box 575 medium priority egress queue, and box 579 low priority egress queue form a hierarchical structure as corresponds to layer, and see col. 7 line 46-col. 8 line 67), logical interfaces, or physical interface (see figure 6 box 250 egress driver), and wherein only one queue within a branch of the queue hierarchy is a priority queue (see figure 5 where box 570 a high priority egress queue is the only priority queue in the branch).

Regarding claim 2, Zdan teaches the packet scheduling system comprises at least three layers of hierarchy (see column 6 line 45-67).

**Regarding claim 3**, Zdan teaches the at least a portion of said plurality of queues have the minimum bandwidth attribute defined **(see column 6 line 5)**.

**Regarding claim 4**, Zdan teaches at least a portion of said plurality of queues have the excess bandwidth attribute defined **(see column 6 line 6)**.

**Regarding claim 5**, Zdan teaches at least a portion of said plurality of queues have said maximum bandwidth attribute defined **(see column 7 line 34 and column 8 line 29)**.

**Regarding claim 6**, Zdan teaches the attributes not defined at each of said plurality of queues have a default value **(see column 7 line 65 token)**.

**Regarding claim 7**, Zdan teaches each of said dequeue attributes are defined **(see column 8 line 41-67)**.

**Regarding claim 8**, Zdan teaches each of said plurality of queues set as a priority queue sends traffic ahead of other queues sharing a parent node **(see column 8 line 46-67)**.

**Regarding claim 9**, Zdan teaches each of said plurality of queues having a defined priority attribute have defined a level of priority **(see column 8 line 46-67)**.

**Regarding claim 10**, Zdan teaches priority nodes are configured as conditional or unconditional priority nodes **(see column 6 line 7)**.

**Regarding claim 11**, Zdan teaches each of said plurality of queues is configured to allow for an oversubscription mode in which minimum rates are oversubscribed (see column 6 line 6).

**Regarding claim 12**, Zdan teaches the traffic management node further comprises a pre-queuing operator configured to operate on at least some of said incoming traffic streams before the streams enter the queuing system(see column 6 line 37-44).

**Regarding claim 13**, Zdan teaches the traffic management node further comprises a post-queuing operator configured to operate on at least some of said incoming traffic streams after the streams pass through the queuing system (see column 6 line 62-65).

**Regarding claim 15**, Zdan teaches each of said plurality of queues comprises a minimum-rate propagation attribute (see column 6 line 8-10).

**Regarding claim 16**, Zdan teaches each of said plurality of queues comprises a priority propagation attribute (see column 6 line 42-44).

**Regarding claim 17**, Zdan teaches the traffic management nodes operate according to a specified behavioral model and a plurality of components within a network system comprise one or more of the traffic management nodes (see column 6 line 25-41).

**Regarding claim 18**, Zdan teaches a common configuration language is provided for user interface with the behavioral model (see column 5 line 46-49 and it is inherent that system and user interface use a common configuration language).

**Regarding claim 19**, Zdan teaches the depth of a queue is controlled by a specified maximum queue depth (see column 8 line 8-15).

**Regarding claim 21**, Zdan teaches method for hierarchical traffic management at a network device having a queuing system (see figure 2 box 240 and column 6 line 56-60) comprising a plurality of layers of hierarchy (see column 6 line 45-67), each layer of the hierarchy configured for supporting one or more priority nodes (see column 6 line 56-60) and associated with a class (see figure 5 where middle column box 520 EF queue, box 530 AF1 queue, box AFN queue, and box 550 BE queue, and the right column box 570 high priority egress queue, box 575 medium priority egress queue, and box 579 low priority egress queue form a hierarchical structure as corresponds to layer, and see col. 7 line 46-col. 8 line 67 and see col. 9 lines 9-17), logical interface, or physical interface (see figure 6 box 250 egress driver), one or more nodes having a guaranteed minimum rate (see column 6 line 5), one or more nodes designated for receiving excess bandwidth (see column 6 line 8-10), and one or more nodes having a defined maximum rate (see column 6 line 6), the method comprising:

- classifying incoming traffic streams (**see column 6 line 36 and line 45-50**); and
- applying scheduling policies to said traffic streams at one or more queues, said scheduling policies comprising minimum bandwidth (**see column 6 line 5**), maximum bandwidth (**see column 6 line 6**), excess bandwidth (**see column 6 line 8-10**), and priority, wherein traffic up to a specified bandwidth is defined as priority traffic (**see column 6 line 56-60**);
- wherein only one node within a branch of the hierarchy is a priority queue (**see figure 5 where box 570 a high priority egress queue is the only priority queue in the branch**).

**Regarding claim 22**, Zdan teaches the one or more of the scheduling policies at said one or more of the queues have default values applied (**see column 7 line 65 token**).

**Regarding claim 23**, Zdan teaches the scheduling policies further comprise priority propagation which specifies whether or not priority service at a queue is propagated through a hierarchy of the queue (**see column 8 line 25-67**).

**Regarding claim 24**, Zdan teaches a burst tolerance parameter is associated with a stream enabled with priority propagation (**see column 6 line 8-10**).



**Regarding claim 25**, Zdan teaches the burst tolerance parameter is provided for each layer of hierarchy through which priority behavior propagates (**see column 6 line 5-10**).

**Regarding claim 26**, Zdan teaches the burst tolerance parameter indicates how much the stream is permitted to burst beyond a rate constraint of an ancestral node before the stream becomes constrained by the rate (**see column 6 line 5-10 and column 9 line 38-55**).

**Regarding claim 27**, Zdan teaches the scheduling policies further comprise minimum rate propagation which specifies whether or not a minimum rate at a queue is propagated through a hierarchy of the queue (**see column 8 line 41 –67**).

**Regarding claim 28**, Zdan teaches further comprising enabling an oversubscription mode in which oversubscribed streams are reduced in proportion to a specified oversubscription minimum rate (**see column 6 line 8-10**).

**Regarding claim 29**, Zdan teaches a computer-readable medium storing computer-executable instructions (**see column 4 line 45**) for hierarchical traffic management at a network device having a queuing system (**see figure 2 box 240 and column 6 line 56-60**) comprising a plurality of layers of hierarchy (**see column 6 line 45-67**), each layer of the hierarchy configured for supporting one or more priority nodes (**see column 8 line 41-67**) and associated with a class (**see figure 5 where middle column box 520 EF queue, box 530 AF1 queue, box AFN queue , and box 550 BE queue, and the right column box 570 high priority egress queue, box 575 medium**

**priority egress queue, and box 579 low priority egress queue form a hierarchical structure as corresponds to layer, and see col. 7 line 46-col. 8 line 67 and col. 9 lines 9-17), logical interface, or physical interface (see figure 6 box 250 egress driver), one or more nodes having a guaranteed minimum rate (see column 6 line 5), one or more nodes designated for receiving excess bandwidth (see column 6 line 8-10), and one or more nodes having a defined maximum rate (see column 6 line 6), the instructions comprising:**

- **code that classifies incoming traffic streams (see figure 2 box 220 and column 6 line 36 and 45-50); and**
- **code that applies scheduling policies to said traffic streams at one or more queues, the scheduling policies comprising minimum bandwidth (see column 6 line 5), maximum bandwidth (see column 6 line 6), excess bandwidth (see column 6 line 8-10), and priority, wherein traffic up to a specified bandwidth is defined as priority traffic (see column 5 line 46-49);**
- **wherein only one node within a branch of the hierarchy is a priority queue (see figure 5 where box 570 a high priority egress queue is the only priority queue in the branch).**

**Regarding claim 30,** Zdan teaches system for hierarchical traffic management at a network device having a queuing system comprising a plurality of layers of hierarchy **(see column 6 line 45-67), each layer of the hierarchy configured for supporting one or more priority nodes (see column 8 line 41-67) and associated with a**

class (see figure 5 where middle column box 520 EF queue, box 530 AF1 queue, box AFN queue, and box 550 BE queue, and the right column box 570 high priority egress queue, box 575 medium priority egress queue, and box 579 low priority egress queue form a hierarchical structure as corresponds to layer, and see col. 7 line 46-col. 8 line 67 and col. 9 lines 9-17), logical interface, or physical interface (see figure 6 box 250 egress driver), one or more nodes having a guaranteed minimum rate (see column 6 line 5), one or more nodes designated for receiving excess bandwidth (see column 6 line 8-10), and one or more nodes having a defined maximum rate (see column 6 line 6), the method comprising:

- means for classifying incoming traffic streams (see figure 2 box 220 and column 6 line 36 and 45-50); and
- means for applying scheduling policies to the traffic streams at one or more queues (see column 8 line 41-67), the scheduling policies comprising minimum bandwidth (see column 6 line 5), maximum bandwidth (see column 6 line 6), excess bandwidth (see column 6 line 8-10), and priority, wherein traffic up to a specified bandwidth is defined as priority traffic (see column 5 line 46-49).
- wherein only one node within a branch of the hierarchy is a priority queue (see figure 5 where box 570 a high priority egress queue is the only priority queue in the branch).

***Claim Rejections - 35 USC § 103***

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zdan in view of Abdelilah et al. (US6940864).

Regarding claim 14, Zdan disclose all the subject matter of the claimed invention with the exception of the post-queuing operator is configured to compress packets. Abdelilah et al. from the same or similar fields of endeavor teaches the use of compress user data and repack the data frame before dispatching it to the output (**see Abdelilah et al. column 4 line 48-50**).

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the compression of user data as taught by Abdelilah et al. in the

system for and method of differentiated queuing in a routing system of Zdan in order to provide enhance system efficiency.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zdan in view of Wong (US6721796).

Regarding claim 20, Zdan disclose all the subject matter of the claimed invention with the exception of the depth of a queue is controlled by specification of a Random Early Detection profile. Wong from the same or similar fields of endeavor teaches the use of Random Early Detection admission control mechanism where average buffer length is measured (**see column 5 line 46- column 6 line 14**).

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the RED as taught by Wong in the system for and method of differentiated queuing in a routing system of Zdan in order to provide optimized data throughput and maintaining fairness amongst different flows, particularly for processing arriving data units for allocation in hierarchical buffer systems (**see column 1 line 32- 37**).

#### ***Response to Arguments***

8. Applicant's arguments filed 12/27/2007 have been fully considered but they are not persuasive.

9. **With regard to applicant's remark for claim 1 (page 9)**, applicant submits that Zdan does not disclose a queue hierarchy, wherein each layer is configured to support one or more priority queues and is associated with a class, logical interface, or physical interface, and only one queue within a branch of the hierarchy is a priority queue.

As cited in the rejection, Zdan discloses a hierarchical queuing structure in figure 5, where queuing manager distributes packet into different queues in the middle column: EF queue, AF1 queue, AFN queue, and BE queue. The packet is then forward to its priority queue, which is the only priority queue in the branch, on the right column. Figure 5 shows a hierarchical structure queuing, and one (high, medium, or low) priority queue in that branch, and meets the limitation, and rejection respectfully remains.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Snyder II et al. (US6888830),

Albuquerque et al. (US2004/0156367),

Wishneusky et al. (US2005/0036495),

Channegowda et al. (US2005/0047415),

Romano et al. (US2005/0220115).

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WUTCHUNG CHU whose telephone number is (571)270-1411. The examiner can normally be reached on Monday - Friday 1000 - 1500EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on 571 272 7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2619

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/WC/  
Wutchung Chu

/Edan Orgad/

Supervisory Patent Examiner, Art Unit 2619